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REMARKS

In response to the action, Applicants have attached additional definitions of the term "slurry" for consideration. Applicants respectfully request reconsideration in view of the attached definitions and the following remarks.

The action rejects claims 1 to 4 as being unpatentable over Small (US Pat. No. 5,981,454) in view of Chopra (US Pat. No. 6,276,996) or Verhaverbeke (US Pat. No. 5,972,123) as evidenced by Grant & Hackh's Chemical Dictionary (page 121), Hawley's Condensed Chemical Dictionary (page 1066), Wang et al. (US Pat. No. 6,435,944) and Merriam-Webster's Collegiate Dictionary (tenth edition, page 1107). Small discloses a post-polishing treatment solution that can be useful in a two-step polishing process—Col. 6, lines 4 to 6. In this process, the solution facilitates oxidizing the metal surface and "the subsequent abrasion of the oxide surface with an emulsion slurry". Claim 1 includes a polishing solution useful for polishing and removing copper without abrasives. Unlike Applicants' abrasive-free claim 1, Small only oxidizes the metal surface and relies upon an emulsion slurry to remove copper. The action now relies upon Wang et al. and Merriam-Webster's Dictionary to establish that solids are optional for "slurry" formulations. While Applicant may be his own lexicographer, a term may not be given a meaning repugnant to the usual meaning of the term. MPEP § 706.03(d). Analogous to claim drafting with an inconsistent definition, the rejection relies upon an inaccurate definition of the term slurry. Applicants distinguish the references as follows:

1. The context of Wang et al. at Col. 5, Col. 1, includes a "strategically formulated slurry for CMP metals" with or without abrasive particles. Furthermore, it implies that these

abrasive-free formulations rely upon fixed abrasive pads. Wang et al.'s use of the term slurry, however, represents a careless use of the English language and does not define the accepted use of the term "slurry" in the general field of CMP polishing.

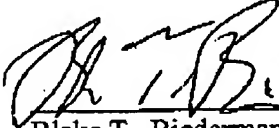
2. Merriam-Webster's collegiate Dictionary defines slurry as a water mixture of in soluble matter (as mud, lime or plaster of paris). Since mud, lime and plaster all contain insoluble solid particles, this definition is consistent with the use in the CMP polishing art.
3. Small at Col. 3, lines 24 and 25 describe cleaning of slurry particles. This context is consistent with the conventional use of insoluble solid particles to form CMP polishing slurries. Furthermore, when read in context with Small at Col. 6, lines 3 to 5 and the ordinary accepted meaning of the term slurry, Small requires the presence of abrasive particles for polishing and removing copper.
4. The attached Penguin Dictionary of Chemistry, Second Edition (page 361) describes slurry as "A liquid containing an appreciable quantity of suspended solid."
5. The attached copy of online Wikipedia encyclopedia describe slurry as "a thick suspension of solids in a liquid".

Since the solution of Small only oxidizes the metal surface and relies upon an emulsion slurry for polishing, the combined references fail to disclose an abrasive-free slurry for polishing and removing copper. Thus, since the combined references fail to disclose an abrasive-free slurry for polishing and removing copper, Applicants respectfully submit that the combined references fail to disclose or suggest claims 1 to 4, as amended earlier.

Applicants respectfully submit that the application is in proper form for allowance. If a telephone call would expedite prosecution, please call Applicants' attorney at (302) 283-2136.

Respectfully submitted,

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Date


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THE PENGUIN DICTIONARY OF CHEMISTRY

Second Edition

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acetonitrile, nitromethane, sulphur dioxide or toluene. It is a white solid, very soluble in water and ether, moderately soluble in benzene.

silver halide grains The individual silver halide crystals in a photographic emulsion.

silver nitrate, AgNO₃. The most important compound of silver, obtained by dissolving the metal in dilute nitric acid, and crystallizing. On strong heating silver nitrate decomposes into silver, N₂O₄, and oxygen. It has m.p. 212°C.

silver oxides
Silver(I) oxide, Ag₂O, is obtained as a brown amorphous precipitate by the action of alkali on AgNO₃ solution. It cannot be obtained pure and is soluble in ammonia solution.
Silver(II) oxide, Ag₂O, is a black solid, Ag₂Ag^{III}O₂, obtained by anodic or persulphate oxidation of an AgNO₃ solution. Continued anodic oxidation gives impure Ag₂O₃. Argentates, e.g. KAgO, containing silver(I) and mixed metal oxides containing Ag(I), Ag(II), and Ag(III) are known.

silver perchlorate, AgClO₄. Prepared by the action of HClO₄ on Ag₂CO₃. AgClO₄ is extremely soluble in water and ether and is also soluble in benzene and toluene.

silver salt The commercial name for sodium anthraquinone-2-sulphonate. See anthraquinone sulphonic acids.

silver sulphate, Ag₂SO₄. Prepared by dissolving silver in concentrated H₂SO₄ or by addition of a sulphate to AgNO₃. Only sparingly soluble in water. Decomposes on heating to Ag₂SO₃ and O₂.

silver sulphide, Ag₂S. Obtained as a black precipitate by the action of H₂S on a solution of any silver salt. It is very insoluble in water.

silylation Formation of R₃Si - derivatives (R-H or organic). See silicones.

silyl compounds Derivatives of the H₃Si - group.

SIM Scanning ion microscopy.

simazine, 2-chloro-4,6-bis(ethylamino)-s-triazine, C₆H₁₁ClN₃. A pre-emergence herbicide.

Simmone-Smith reagent Named after the DuPont chemists who discovered that diiodomethane would react with an active zinc-copper couple in ether to give a reagent with molecular formula ICH₂ZnI. The reagent adds stereospecifically cis- to alkenes to give cyclopropanes in high yields.

SIMS Secondary Ion Mass Spectroscopy.

single bond A bond between two atoms with two electrons occupying the bonding orbital and no further electronic interaction between the atoms. Generally a σ-bond, e.g. as in the C-H bonds in CH₄, but can be essentially a π-bond, as in Ni(PF₃)₄.

singlet A single transition in a spectrum with other levels at very different energies.

singlet state See spin multiplicity.

sinsgrin, C₈H₁₄KO₆S₂. M.p. 120°C. The best known of the mustard glycosides; it is hydrolysed to allyl isothiocyanate, glucosa and potassium hydrogen sulphate by the enzyme myrosin, which accompanies it in mustard seed.

sintering The process of bonding by atomic or molecular diffusion in which powders are heated under pressure but at a temperature below the melting point. Used for metals and high melting polymers, e.g. polytetrafluoroethylene. The process depends upon such mobility of the atoms or molecules in the surface layers as to cause physical diffusion between the lattices of the separate particles and thus physical joining of the lattices.

sitosterol, 24-(24-R)ethylcholesterol, C₂₇H₄₈O. M.p. 137°C. The main plant sterol but is often accompanied by related sterols, from which it is difficult to separate. The glucoside, m.p. 250°C, is also very common in plants and has been described by a variety of names. Sitosterol is accumulated by many invertebrate marine animals.

size measurement See particle size measurement.

size reduction equipment Plant for particle size reduction which generally falls under the description of crushers, grinders, mills or disintegrators.

sizing The process of filling the pores of paper and giving it some degree of water-repellency. This can be done either in the beaters by the addition of rosin and alum or a colloidal mixture, such as starch and water-glass, when the process is termed engine sizing, or by spraying the surface of the ready-made paper with glue or the like when it is known as surface sizing. See paper.

skatole, 3-methylindole, C₈H₇N. M.p. 95°C, b.p. 263-266°C. The chief volatile constituent of the faeces, being formed by the action of the intestinal bacteria on tryptophen. It occurs also in coal tar and in beetroots.

smelting 361

Skrup's reaction See anthranol.

slack wax An oily wax obtained from crude oil or oil fractions by chilling or by treatment with methyl ethyl ketone. Slack wax can be cracked to produce higher alkenes (C₄-C₁₀) for use in the production of detergents.

slag A liquid solution of oxides produced in the smelting and refining of metals. The primary function of slag in smelting is to take into solution the gangue of the ore and separate it from the liquid metal. To achieve this fluxes are added which reduce the melting point of the oxide mixture. Common fluxes are alumina, limestone or lime, silica and iron(III) oxide. In addition to removing gangue, the slag can also exert a refining function in smelting processes, e.g. the desulphurization of iron in the blast furnace. In smelting, slag composition depends on the metal being smelted.

Slags are also produced in metal refining processes where oxidation is used to separate the impurities, e.g. steelmaking, copper and lead refining. The aim in refining is to control the slag composition to effect the removal of impurities and this process invariably means that some of the parent metal is oxidized and passes into the slag. In steelmaking the aim is to remove C, S and P and this requires a slag high in CaO, i.e. a basic slag.

Slags are often sold for use in other industries. Thus blast furnace slag can be used for manufacturing cement, as road metal, as slag wool. The slag from the basic steelmaking process sometimes contains sufficient P₂O₅ to make it suitable as an agricultural fertilizer and it is sold as 'basin slag'; the high lime content of these slags is also useful. Converted to slag-ceram by crystallization of the glass from slag.

slaked lime, Ca(OH)₂. See calcium hydroxide.

slip planes The planes of weakness in crystals corresponding to crystalline boundaries and to planes of atoms with only weak forces between such planes (e.g. the layers in graphite).

slow combustion See cool flames.

slurry A liquid containing an appreciable quantity of suspended solid.

slush bath See low temperature baths.

Sm Saturnium.

snakel cracks Crystal defects - dislocations.

swolting The melting of an ore with chemical reaction with other materials. A part of the process of winning an element from its ore.

Slurry - Wikipedia, the free encyclopedia

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Slurry

From Wikipedia, the free encyclopedia

A **slurry** is, in general, a thick suspension of solids in a liquid and may be:

- A mixture of water and Bentonite used to make slurry walls
- A mixture of wood pulp and water used to make paper
- A mixture of water and animal waste used as fertilizer
- Meat slurry, a food product
- An abrasive substance used in chemical-mechanical polishing, a semiconductor manufacturing process
- A mixture of ice crystals, water and freezing point depressant, called slurry ice
- A wet-process cement rawmix
- Australian slang for a promiscuous lady.

See also

- Slurry pipeline

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Category: Disambiguation

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